WHAT IS CLAIMED IS:

1. A reactor core cooling structure that has a circular reactor core filled with a spherical fuel, and is applied to a pebble bed high temperature gas reactor for carrying reaction heat of said circular reactor core by a cooling gas consisting of any of helium and carbon dioxide, the structure comprising:

cooling gas flow-in slits for making said cooling gas flow in said circular reactor core, which slits are provided at an outer graphite cylinder for covering an outside of said circular reactor core;

cooling gas flow-out slits for making said cooling gas flow out from said circular reactor core, which slits are provided at an inner graphite cylinder for covering an inside of said circular reactor core;

a circular cooling gas flow path that is provided at an outside of said outer graphite cylinder, and is connected to an inlet piping of said cooling gas at a foot of the outer graphite cylinder; and

an inner cooling gas flow path that is provided at an inside of said inner graphite cylinder, and is connected to an outlet piping of said cooling gas at a foot of the inner graphite cylinder.

2. The reactor core cooling structure according to claim 1, wherein said circular cooling gas flow path is a double-circular flow path connected at a top thereof, and wherein after guiding said cooling gas flowing from said inlet piping till the top through an outer circular gas flow path, the circular cooling gas flow path introduces the cooling gas from said cooling gas flow-in-slits to said circular reactor core, while making the cooling gas flow down through an inner circular gas flow path.

3. The reactor core cooling structure according to claim 1, wherein depending on an output density distribution of said circular reactor core in a

height direction, a ratio of an opening area of said cooling gas flow-in slits is adjusted, based on height of said circular reactor core, whereby a cooling gas temperature distribution of said cooling gas flow-out slits is kept uniform in the height direction of said circular reactor core.

4. The reactor core cooling structure according to claim 2, wherein depending on an output density distribution of said circular reactor core in a height direction, a ratio of an opening area of said cooling gas flow-in slits is adjusted, based on height of said circular reactor core, whereby a cooling gas temperature distribution of said cooling gas flow-out slits is kept uniform in the height direction of said circular reactor core.